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# ANNUAL REPORT

## 1961

# BURLINGTON ELIZABETH GARDENS
# SEWAGE TREATMENT PLANT

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Annual report on Burlington Elizabeth Gardens : sewage treatment plant.

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# ANNUAL REPORT

# ON

# BURLINGTON ELIZABETH GARDENS

# SEWAGE TREATMENT PLANT

OWRC PROJECT - 58-S-28

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# ANNUAL REPORT
# ON
# BURLINGTON ELIZABETH GARDENS
# SEWAGE TREATMENT PLANT
# OWRC PROJECT - 58-S-28

## GENERAL

The Burlington Elizabeth Gardens Sewage Treatment Plant is one of two activated sludge type sewage treatment plants operated for the Town of Burlington by the OWRC.

The plant islocated in close proximity to residential properties in the Elizabeth Gardens subdivision which is near the eastern boundaries of the Town of Burlington.

## PLANT DESCRIPTION

The plant is of the activated sludge type and was designed to provide complete treatment for 750,000 Imperial gallons of domestic sewage per day. Primary treatment is provided by coarse screens in the influent well, a Chicago Pump Company Barminutor, an air degrittor providing ten minutes retention and two primary clarifiers, each 22 feet in diameter with a 9 foot side wall depth. Secondary treatment facilities consist of two aeration tanks, each of 286,000 Imperial gallon capacity and one final clarifier 40 feet square with a 9 foot average depth. A chlorine contact chamber giving 10 minutes retention is also provided. Sludge disposal is obtained through a single stage digester with disposal of liquid sludge by tank truck to farms in the area.

## PLANT OPERATION

The plant is operated by the chief, Mr. Stinson, and one operator, Mr. Hordyck, under the control of OWRC Plant Operations Division head office staff. The plant is normally under 11 hour supervision daily.

Operation of this plant has been made somewhat difficult by two conditions; its close proximity to residences and a heavy waste influent originating at a local meat packing plant. The waste from the meat packing plant is extremely strong, both in BOD and solids and this condition has caused a plant overload with, in many instances, septicity and resulting odours. Because of the nearness of homes, these odours have caused complaints from local residents. As part of the attempt to treat these strong wastes, both of the plant air blowers were run. The blower installation was such that these units were very noisy, and this resulted in an increase in complaints from nearby residents.

In the early part of October of 1961, the maintenance crew from the Division of Plant Operations relocated these blowers on more substantial bases in the basement of the control building. This resulted in a partial reduction in the noise level but was not completely satisfactory. In view of this, it is planned to install intake silencers on these units within the near future.

The strong packing house wastes first became a problem early in the summer and as the production at the meat packing plant increased, the problem became more serious. In September, a full scale investi-

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gation of the conditions was started by the Industrial Wastes Division of the OWRC in conjunction with the Sanitary Engineering and Plant Operations Divisions. Results of this investigation are still not available pending completion of some additional experimentation but some relief from the conditions was noticed immediately after the meat packing plant was made aware of the magnitude of the situation.

An additional factor which complicated operation of the plant was the difficulty experienced in disposing of the digested sludge. A contract for the disposal was prepared in July but various delays resulted in its being signed in September. Subsequent to the execution of this contract difficulty of disposal by the contractor resulted in rather unsatisfactory performance of the contract conditions. It is felt that this problem has been resolved.

During 1961, the head office maintenance staff of the Division of Plant Operations spent 347 man hours at this plant doing routine maintenance and moving equipment.

## PLANT PERFORMANCE

Prior to the startup of the meat packing plant now discharging wastes to the plant, the flows consisted mainly of large quantities of very weak sewage. After the meat packing plant began discharging wastes to the plant the BOD and solids content of the sewage rose sharply to a point where the plant soon became overloaded from a strength standpoint.

Graph No. 1 (Average Daily Flow) indicates the extremely high flows obtaining at this plant in the spring. These flows gradually subsided to an approximate average of 0.43 mgd in the second half of the year as compared to an average daily flow of 0.51 mgd in the first half.

Graph No. 2 (BOD and Suspended Solids) shows the gradual increase in the plant influent BOD and suspended solids content. It is felt that these increases are directly attributable to the waste discharge from the meat packing plant.

The efficiency of treatment remained high throughout the year, ranging from a minimum reduction in BOD of 84.5% to a maximum of 99% with a yearly average of 91.6%. Comparable figures for the reduction of suspended solids show a minimum of 30%, maximum of 98% and yearly average of 85%. The reductions achieved may be considered as about average for sewage treatment plants of the activated sludge type.

A rather disturbing condition relating to the plant load has been calculated from the test results for the six months prior to December.

The average daily flow over that period was 0.457 mgd with an average BOD content of 466 ppm and average suspended solids content of 400 ppm. This resulted in an average daily loading of the plant of 2130 pounds of BOD and 1828 pounds of suspended solids. From the design figures for the plant and using an average domestic sewage influent containing 200 ppm, BOD and suspended solids, it is calculated that the design loading for the plant is 1500 pounds per day of BOD and suspended solids. Thus, the plant was overloaded by 42% in BOD and 22% in suspended solids for this period.

The meat packing plant which now discharges wastes to the Elizabeth Gardens sewage treatment plant is cooperating in the reduction of the strengths of these wastes, but is in a process of expanding the production capacity. Therefore, any reduction in strength of waste may be offset by an increase in quantity of waste. Therefore, no reduction of the operating problems caused by these wastes can be seen in the near future.

## OPERATING COSTS

The cost of operating the Elizabeth Gardens plant for 1961 was $22,091.39. This is broken down as follows:

| | |
|---|---|
| Payroll | 43.0 % |
| Fuel | 2.0 % |
| Power | 19.5 % |
| Chemicals | 8.7 % |
| General Supplies | 6.5 % |
| Equipment | 3.7 % |
| Repairs and Maintenance | 2.0 % |
| Sundry (including sludge disposal) | 12.6 % |
| Water | 2.0 % |

The total flow in 1961 was 172.7 million Imperial gallons. The average cost of treatment, therefore, was 12.7¢/1000 gallons.

## SUMMARY

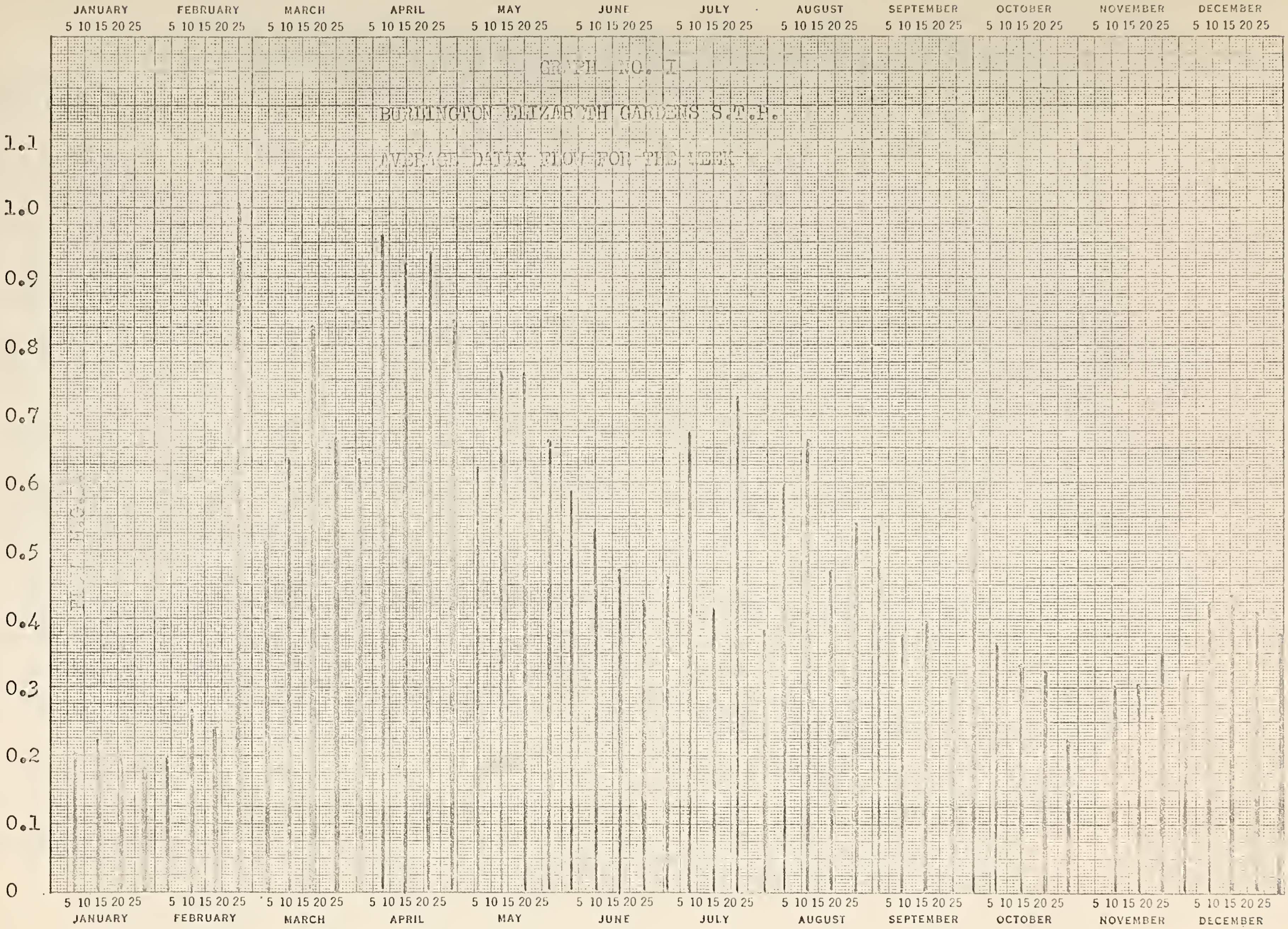
In 1961, the flow characteristics obtaining at the Burlington Elizabeth Gardens Sewage Treatment Plant changed from large quantities of weak sewage to lower quantities of extremely strong sewage. This change was apparently caused by the discharge of meat packing plant wastes into the sewers leading to the plant. No relief from this condition is anticipated in the near future.

One of the objectionable characteristics of the plant was a high noise level caused by the air blowers. This problem was somewhat alleviated by Plant Operation Division head office staff and further work is planned for the coming year to completely cure the situation.

The cost of operation ($127.00 per million gallons annually) was about average for this type and size of sewage treatment plant.

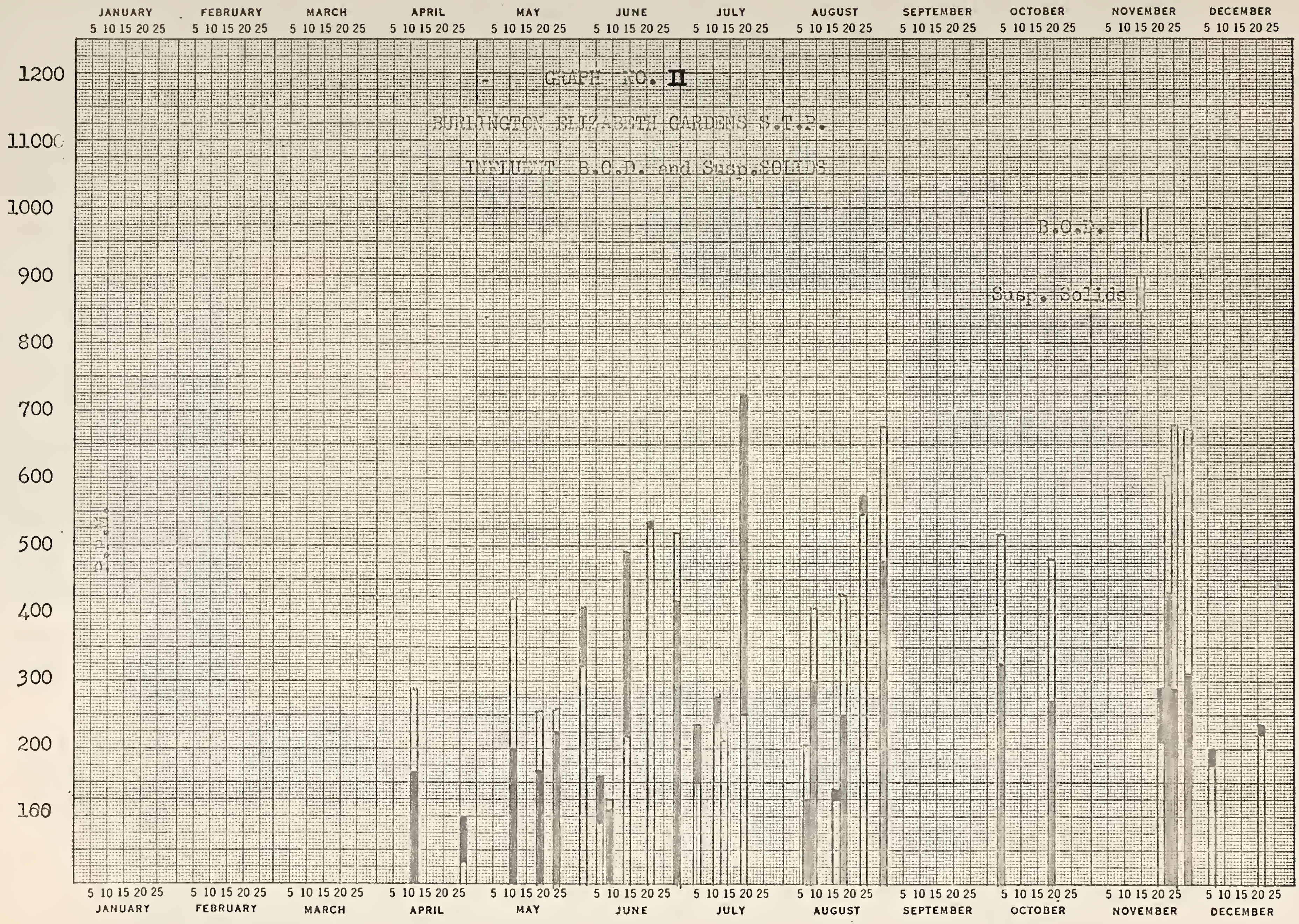
MICROGRAPH

1 YEAR BY DAYS X 250 DIVNS.
CALENDAR YEAR


GRAPH NO. I

BURLINGTON ELIZABETH GARDENS S.T.P.

AVERAGE DAILY FLOW FOR THE WEEK



GRAPH NO. II

BURLINGTON ELIZABETH GARDENS S.T.P.

INFLUENT B.O.D. and Susp.SOLIDS

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